

DESIGN OF STEEL STRUCTURE

Paper Code: ETCE-305
Paper: Design of Steel Structure

L	T/P	C
3	1	4

INSTRUCTIONS TO PAPER SETTERS:

Maximum Marks: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

***Objective:** To provide a basic understanding of use of steels in civil engineering, and to develop technical competence in the design of simple bolted and welded connections, tension and compression members, beams and plate girders. The course also deals with plastic analysis of structures.*

UNIT I

Introduction: Types of steel structures like industrial buildings, beams/truss/arch/ suspension bridges, Beam and column framing, Rolled steel section, Advantages of steel as a structural material. Introduction to working stress and limit state theories, Type of sections, Connections and frames.

Riveted connections: Analysis and design of various types of riveted connections, permissible stresses in rivets, Design criteria, Code requirements, Tacking rivets, rivet joints subject to moment, Stresses in rivets.

Welded connections: Advantage and disadvantages of welding, Design criteria, Code requirements, Analysis and design of Fillet and Butt weld, Fillet weld subjected to moment.

Design of Tension members: Analysis of trusses and design of axially loaded tension member, Lug angle, tension splice.

[T1][No. of Hours: 12]

UNIT II

Design of compression members: Modes of failure in column, Design of compression member, Lacing and battening for built up compression member. Compression member composed of two components back-to-back, column base and foundation, Roof trusses [including Purlins, bracings and connections].

[T1][No. of Hours: 11]

UNIT III

Design of flexural members: Beam, Plate girder, Gantry girder including lateral and flexural torsional building, design of structural elements.

[T2][No. of Hours: 11]

UNIT IV

Plastic Analysis of structures: Moment curvature relationship, shape factor, plastic hinges, upper and lower bounds.

Analysis and Design of Steel Frames: Analysis and Design of frames as per codal recommendations.

[T1,T2][No. of Hours: 11]

Text Books:

[T1] S.K. Duggal, "Limit State Design of steel structures", Tata Mc Graw Hill

[T2] L.S. Negi, "Design of steel structures", Tata Mc Graw Hill

References

[R1] N. Subramanian, "Design of steel structures", Oxford University Press.

[R2] Krishnamurthy, "Elementary Structural Design"-Vol-III, CBS Publishers

[R3] Elias G. Abu-Saba, "Design of steel structures", CBS Publication

[R4] John E. Lothers. "Design of steel structures", Prentice-Hall